

## CLAIMS

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What is claimed is:

5 1. An optical fiber array apparatus for providing optical connections to an optical device, comprising:

10 a) a V-groove chip having a V-groove, a rear portion, a front portion, and a front face opposite the rear portion, and

b) an optical fiber disposed in the V-groove, wherein:

15 1) the optical fiber is bonded to the rear portion of the chip,

2) the optical fiber is not bonded to the front portion of the chip, and

3) wherein the optical fiber extends from the rear portion.

20 2. The apparatus of claim 1 wherein the optical fiber has an endface located within 1 millimeter of the front face.

25 3. The apparatus of claim 1 wherein the V-groove chip has a wick stop trench between the rear portion and the front portion.

30 4. The apparatus of claim 1 further comprising a lid disposed on top of the optical fibers in the rear portion.

35 5. The apparatus of claim 1 wherein the optical fiber has an endface that is flush with the front face.

40 6. The apparatus of claim 1 wherein the front portion is 1-10 millimeters long.

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7. The apparatus of claim 1 wherein the rear portion is 0.2-5 millimeters long.

5 8. The apparatus of claim 1 wherein the front portion has pits for receiving alignment spheres.

10 9. The apparatus of claim 1 wherein the front face is angled nonperpendicularly with respect to the optical fiber.

15 *AN* 10. The apparatus of claim 9 wherein the front face is angled forward.

20 11. The apparatus of claim 1 wherein the V-grooves are large in the front portion so that a location of an optical fiber is not fully determined by the V-groove in the front portion.

25 12. The apparatus of claim 11 wherein the V-groove in the front portion has a flat bottom surface.

30 13. An optical fiber array apparatus for providing optical connections to an optical device, comprising:  
a) a V-groove chip having a V-groove, a rear portion, a middle portion, a bonded front portion, and a front face opposite the rear portion, and  
b) an optical fiber disposed in the V-groove, wherein:  
1) the optical fiber is bonded to the rear portion of the chip,  
2) the optical fiber is not bonded to the middle portion of the chip,

3) the optical fiber is bonded to the bonded front portion of the chip, and  
4) wherein the optical fiber extends from the rear portion.

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14. The apparatus of claim 13 wherein the optical fiber has an endface located within 1 millimeter of the front face.

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15. The apparatus of claim 13 wherein the V-groove chip has a wick stop trench between the rear portion and the front portion.

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16. The apparatus of claim 13 wherein the V-groove chip has a wick stop trench between the middle portion and the bonded front portion.

17. The apparatus of claim 13 further comprising a lid disposed on top of the optical fibers in the rear portion.

18. The apparatus of claim 13 wherein the optical fiber has an endface that is flush with the front face.

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19. The apparatus of claim 13 wherein the bonded front portion is 0.2-2 millimeters long.

20. The apparatus of claim 13 wherein the rear portion is 0.2-5 millimeters long.

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21. The apparatus of claim 13 wherein the front portion has pits for receiving alignment spheres.

22. The apparatus of claim 13 wherein the front face is angled nonperpendicularly with respect to the optical fiber.

5 23. A method for coupling an optical fiber to an optical device disposed on a substrate, comprising the steps of:

10 a) bonding the optical fiber to only a rear portion of a V-groove chip having a rear portion and a front portion;  
b) bonding the optical fiber and front portion of the V-groove chip to the substrate so that the optical fiber is aligned with the optical device.

24. The method of claim 23 further comprising the step of disposing the optical fiber in a V-groove in the substrate, wherein the substrate V-groove is aligned with the optical device.

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